ORTHOSIS CUFF

The invention relates to an orthosis cuff for the treatment or therapy of Ledderhose's disease or hypermobile ankle joints.

Ledderhose's disease is known to be a particularly painful contraction of the plantar fascia of the foot, in connection with which small nodules and nodes form in the region of the sole of the foot, which stand out against the low-cell fibrous tissue as aponeuroses. The pain is felt primarily in the region of the sole of the foot. It is almost no longer possible to stand up on the affected foot. The etiology of this disease is open to question. All therapies implemented until now have led to little or hardly any success.

The problem of the invention is to provide an orthosis cuff with the help of which the pain of Ledderhose's disease can be alleviated.

For solving said problem, the invention proposes an orthotic cuff which is characterized in that it is made of as stiff material, padded on the inside and encloses the lower leg proximally of the upper ankle joint. The cuff is adapted to fit the outer contour of the lower leg, leaves the upper ankle joint uncovered, and contacts the outwardly

facing area of the lower leg in such a way that that it does not impair the mobility of the upper ankle joint and Achilles tendon and stabilizes the tibiofibular syndesmosis.

An external stabilization of the tibiofibulr syndesmosis is achieved with the newly created cuff while preserving, however, the free mobility of the upper ankle joint. Thus the cuff reduces the movements between the distal ends of the tibia and fibula but allows all other movements in the upper ankle joint. What is effected in this manner are certain changes in the sequence of movements in the upper ankle joint as well as in the lifting and rolling movement of the foot. Overstressing is avoided at the same time. This results in improved overall functioning of the entire ankle joint, notably better distribution of the pressure and thus in a greater capacity to support loads, as well as improved posture. In connection with Ledderhose's disease, such improvements lead to substantial alleviation of the pain in the foot joints (tarsal and mesotarsal joints) up to freedom of pain.

In addition to mobility in the upper ankle joint, the no restriction of the mobility of the Achilles tendon may occur. Furthermore, it is important that the cuff is uniformly resting against the surface of the lower leg all the way around without, however, applying any pressure anywhere because such pressure would again lead to pain. For

stabilizing the tibiofibular syndesmosis, i.e. the apparatus of ligaments between the distal ends of the tibia and the fibula, it is entirely sufficient if the relatively stiff cuff rests all around against the lower leg.

Furthermore, it was surprisingly found that this novel orthotic cuff supplies good services for the above reasons also in connection with hypermobile foot joints, so that the wearer of the cuff will less likely sprain the ankle in spite of hypermobile foot joints and can step on the foot when walking, which effects higher stepping stability.

In both cases addressed above, permanent wearing of the cuff at least effects relief of the pain. A change in the pressure conditions can be distinctly observed after the cuff has been worn for a longer period of time. However, since long-term observations over longer periods of time are not yet available, a statement on final healing is not yet secured empirically. However, based on the observations made to date, permanent wearing of the orthotic cuff as defined by the invention safely results in substantial alleviation of the pain. This means that a preliminary goal of the therapy has been accomplished.

Provision is made according to a useful further development of the invention that an anterolateral truss pad is arranged on the inside of the cuff in the region of the

tibiofibular joint. Said truss pad additionally stabilizes especially the tibiofibular joint and in this way further increases the effect of the orthotric cuff in a substantial manner.

The cuff is usefully produced from stiff leather or plastic material and comprises a stiff functional component completely surrounding the lower leg, as well as closing elements that overlap each other on the ends of the functional component. The functional component, which completely surrounds the lower leg without any gaps after the cuff has been attached, can be fixed in the correct position with the help of such closing elements.

The closing elements may be provided in the form of, for example, belts located on the one side and matching buckles positioned on the other side. As an alternative, the closing elements can be provided in the form of ribbons made of Velcro material located on the one and corresponding eyes positioned on the other side. Closing elements provided in such a form permit attaching the cuff with adequate firmness for the stabilization, which is important for the therapeutic success; however, not with excessive tightness, which would cause pain.

According to another embodiment of the orthotic cuff as defined by the invention, provision is made that the cuff is

provided in the form of an open ring made of elastic material, whereby the elasticity forces the cuff into its shape surrounding the lower leg. With such an embodiment of the cuff it is possible to entirely dispense with the use of closing elements such as belts, buckles or Velcro ribbons. The cuff is simply attached to the lower leg with elastic deformation and clings to all sides of the lower leg with elastic rebound force of the ring.

The highly elastic ring may be made of, for example a highly elastic plastic, for example polycarbonate. Alternatively, a highly elastic metal, for example stainless steel may be considered for producing the ring as well.

Exemplified embodiments of the inventions are explained in greater detail in the following with the help of the drawings, in which:

FIG. 1 shows a perspective view of the cuff as defined by the invention from the bottom.

FIG. 2 is a perspective view of the cuff shown in FIG. 1 viewed from the other side.

FIG. 3 is a top view of a layout of the cuff shown in FIGS. 1 and 2.

FIG. 4 is a representation of the foot skeleton combined with the cuff as defined by the invention attached to it; and

FIGS. 6 and 7 are different views of an alternative embodiment of the cuff as defined by the invention.

In FIGS. 1 and 2, the cuff in its entirety is denoted by reference numeral 1. It is substantially comprised of a stiff functional component 2 made of leather or a similarly stiff plastic. Said component surrounds the lower leg and is adapted to the outer contour of the lower leg as accurately as possible. On its distal edge, the stiff functional component is provided with the inwardly molded recesses 2a and 2b, which leave the Achilles tendon and the ankle joint free. Proximally, the functional component has an edge 2c that is smooth for the most part all around.

On the inside and along the edges, the functional component 2 is provided with a padding 3, which consists of a soft and skin-compatible material and which, furthermore is a non-skid material, so that the attached cuff is retained in its position in relation to the lower leg. Furthermore, an anterolateral truss pad 4 is located on the functional component. With the cuff attached, said pad rests externally against the fibula and tibia in the region of the

tibiofibular syndesmosis. This is indicated in FIG. 4 by an arrow 5.

FIGS. 1 to 3 show that the stiff functional component is adequately long for surrounding the lower leg on all sides without any gaps. The closing elements 6, which overlap each other, are arranged on the ends of the functional component 2. As shown in the embodiment according to FIGS. 1 to 3, said closing elements are provided in the form of ribbons made of Velcro material on the one side, and corresponding eyes located on the other side. If necessary, said closing elements 6 also may be belts on the one and corresponding buckles positioned on the other side.

An orthotic cuff with a basically different structure is shown in FIGS. 6 and 7, where the functional component is a ring 7 that is made of elastic material and is open on one side. The elasticity of said material forces the cuff into its shape surrounding the lower leg. Said ring 7 either consists of highly elastic plastic, e.g. polycarbonate, or a highly elastic metal such as, for example stainless steel. The cuff so designed is placed around the lower leg like a clasp and then kept in position by the elastic rebound forces of the ring 7. The present embodiment of the cuff does not require any closing elements.